suppliers of ISP service to businesses.[27] Other large ISP's have long-term exclusive agreements with certain backbone operators. As mentioned earlier, WorldCom-affiliated backbone providers have long-term agreements to provide service to both AOL (as well as CompuServe) and MSN, which are ISPs that represent over 50% of the market for household customers. Because of these factors, the results contained in Figure 2 are likely to be conservatively low estimates of the actual market share of MCI/WorldCom-affiliated backbones when adjusted to include self-supplied services and services purchased by ISPs.

ii. WorldCom's Market Share of Connections to Other Backbones

54. Anecdotal evidence suggests UUNET also has a large share of the bandwidth of connections to other backbones. UUNET connects to other backbones at MAE East, West, New York NAP, CIX in Palo Alto and Digital IX in Palo Alto and currently has 40 private DS-3 connections to other backbones and by the end of 1997 had plans for 50 private DS-3 connections with other backbones.[28] According to *BoardWatch*, the other WorldCom-owned backbones, GridNet, CNS, and ANS, are each present at four or more of the US public peering points, but detailed information on their private peering arrangements is not available. *BoardWatch* does not provide information on the Verio backbone.[29]

55. UUNet is also interconnected with a number of international backbones whose service areas include: Thailand, Switzerland, Finland, Russia, India, Europe/N. Africa, Germany, Kuwait, Japan, Bermuda, Sweden, South Africa, and Canada. Additionally, the WorldCom-owned CompuServe (CNS) backbone is interconnected to European backbones at LINX in London, UK and Ebone in Munich, Germany.[30]

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[27] Rajiv Chandrasekaran, "Making UUNet Into a Very Big Deal; With His Agreement With CompuServe and AOL, CEO John Sidgmore Takes It to Another Level", *The Washington Post*, Sept. 29, 1997, p. F12.

[28] "National Backbone Operators - UUNet", *Boardwatch Internet Service Providers Directory for Fall 1997*, Copyright BoardWatch Magazine, 1997, p. 239.

[29] See "National Backbone Operators", *Boardwatch Internet Service Providers Directory for Fall 1997*, Copyright BoardWatch Magazine, 1997, pp. 129-135, 225-236,

[30] Arthur Newman, "Exhibit 4: International Networks Directly Connected to UUNet's Backbone", *The Future of The Internet Access Industry*, Gerard Klauer Mattison & Co. LLC, May 1996, p.84.

## C. Post-Merger Backbone Market Shares and HHI Changes

56. As shown in Figure 3 below, MCI/WorldCom will have between 47% - 49% of the backbone services market, depending on whether the connector-based or bandwidth-based measure is used.

**Figure 3**
**Backbone Market Shares as of Fall 1997**
**Post MCI/WorldCom Merger**

| | Connector-Based[31] | | Bandwidth Based[32] | |
|---|---|---|---|---|
| **Backbone provider** | Number of ISPs with Connections | Market Share | Total Bandwidth (Mbps) | Market Share |
| **MCI/UUNET/CIS/ ANS/GridNet/Verio** | **2838** | **49.34%** | **7321.25** | **46.88%** |
| **Sprint** | 1298 | 22.57% | 2419.03 | 15.49% |
| **AGIS** | 354 | 6.15% | 409.58 | 2.62% |
| **BBN** | 234 | 4.07% | 670.72 | 4.29% |
| **DIGEX** | 114 | 1.98% | 418.69 | 2.68% |
| **CRL** | 106 | 1.84% | 323.04 | 2.07% |
| **GOODNET** | 75 | 1.30% | 432.00 | 2.77% |
| **iStar** | 71 | 1.23% | N/A | N/A |
| **DATAXCHANGE** | 50 | 0.87% | 167.04 | 1.07% |
| **CWIX** | 46 | 0.80% | 242.07 | 1.55% |
| **PSINET** | 35 | 0.61% | 204.87 | 1.31% |
| **SAVVIS** | 33 | 0.57% | 338.73 | 2.17% |
| **AT&T** | 24 | 0.42% | 129.78 | 0.83% |
| **Other** | 474 | 8.24% | 2540.04 | 16.26% |
| **Total** | 5752 | 100.00% | 15616.84 | 100.00% |

31 Source: "Backbone Market Share", *Boardwatch Internet Service Providers Directory for Fall 1997*, Copyright BoardWatch Magazine, 1997, p.6., and http://www.boardwatch.com.

32 Data were obtained through http://www.boardwatch.com on 1/23/1998.

57. Because this is not a horizontal merger where competitors in the market are independent of each other (such as in a manufactured goods industry), traditional metrics of market power such as HHI indices need to be used with caution. In the case where competing providers of a networked service are dependent upon each other to create value, concentration can have a direct adverse effect on both consumers (in this case ISPs and Internet end users) as well as competitors (other backbone service providers). For this reason, the same amount of market share concentration in the Internet backbone industry could be orders of magnitude more harmful for overall welfare than it would be in a non-network based industry.

58. However, even under a traditional analytical frame work such as HHI analysis, this merger would raise significant antitrust concerns. The increase in market share due to the MCI/WorldCom merger would result in a very significant increase in the HHI index as shown below.

**Figure 4**
**HHI in Internet Backbone Service Markets**

| | Connector Based | Bandwidth Based |
|---|---|---|
| **Pre-Merger HHI** | 1837 | 1394 |
| **Post Merger HHI** | 3010 | 2492 |
| **Change in HHI** | **1173** | **1098** |

59. According to the DOJ/FTC Horizontal Merger guidelines, the HHI increase is likely to lead to an increase in market power.

> " Where the post-merger HHI exceeds 1800, it will be presumed that mergers producing an increase in the HHI of more than 100 points are likely to create or enhance market power or facilitate its exercise."[33]

33 *Department Of Justice and Federal Trade Commission Horizontal Merger Guidelines*, April 2, 1992, p.30-31.

## D. Barriers To Entry In the Backbone Services Market

60. Once dominance or market power is achieved in a networked industry, the network externalities that helped create the market power make it extremely difficult for new entrants to dislodge the dominant player. This fact is noted by WorldCom Vice President and UUNET head John Sidgemore, who explained in the *Washington Post*, "Having a big network is a huge barrier to entry for competitors."[34]

61. In the context of the MCI/WorldCom merger, any new entrants into the backbone services market will need to access MCI/WorldCom's backbone customers, and so are highly dependent on connecting to the MCI/WorldCom backbone. Given its dominant position, however, MCI will have much less incentive to efficiently interconnect with the new entrant. By providing inferior interconnection service, MCI/WorldCom causes the new entrant to offer inferior service to its end-use customer, stifling its ability to gain any market share.

62. MCI/WorldCom attempt to argue before the FCC that there are no barriers to entry in the backbone market because they do not dominate the market for underlying transmission facilities and anyone can lease a high-speed line from a long-distance carrier and develop their own backbone.[35] These statements are the same as arguing that because talented software programmers are plentiful, anyone could challenge Microsoft's dominance of the computer operating system market. The point that MCI/WorldCom misses is that in order to compete in the backbone market, the new backbone service provider will be dependent on MCI/WorldCom for interconnection and would be subject to service quality degradation or monopolistic charges imposed by MCI/WorldCom.

63. MCI/WorldCom additionally argue that that a backbone service provider that was treated in such a manner could buy an interconnection with a third party backbone service provider that already had a "peering" arrangement with MCI/WorldCom, and get access to MCI/WorldCom's

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[34] Rajiv Chandrasekaran, "Making UUNet Into a Very Big Deal; With His Agreement With CompuServe and AOL, CEO John Sidgmore Takes It to Another Level", *The Washington Post*, Sept. 29, 1997, p. F12.

[35] Attorneys of WorldCom, Inc. and MCI Communications Corporation, "Summary", *Joint Reply of WorldCom, Inc. and MCI Communications Corporation To Petitions To Deny And Comments In The Matter Of Transfer Of Control Of MCI Communications Corporation To WorldCom, Inc.*, Jan. 26, 1998, p. vii-viii.

backbone via that route. MCI/WorldCom's counterstrategy, however, could be to refuse to provide the equipment upgrades necessary to accept the additional traffic from its "peer," thus degrading service to that party as well. Also, post-merger, the market is concentrated enough that it would provide an opportunity for the third-party backbone to charge monopolistic rates for interconnection.

64. Not only do the actual existence of network externalities create a barrier to entry, but the expectations generated by the presence of network externalities enhances the barrier because it affects consumers behavior in choosing a particular backbone seller. Michael Katz and Carl Shapiro explained in a more general discussion of network externalities and the establishment of technical standards, that, "if consumers expect a seller to be dominant, then consumers will be willing to pay more for the firm's product and it will, in fact be dominant."[36] In the context of backbone services, this expectation effect is likely to cause ISPs to want to be directly connected to the dominant backbone instead of indirectly connected via other backbones, which might have congested connections to the dominant backbone. The expectations phenomenon is probably exacerbated in network-based markets experiencing high growth rates such as Internet backbone markets.

65. Another important barrier to entry in the backbone market is the congestion of the public NAPs. As I mentioned earlier, smaller backbones who do not have enough traffic to justify interconnecting with other backbones and ISPs at private interconnection points are particularly reliant on the public NAPs as a cost-effective option for interconnecting with multiple backbones and ISPs, allowing them to decrease their reliance on the larger backbones. Because the NAPs are congested, small new entrants into the backbone markets are less able to rely on them for interconnection and are forced to rely on negotiating private interconnection agreements with the very competitors who have the most to gain if the new entrants are not able to enter the backbone market efficiently. To the extent that the NAPs remain congested, new entrants into backbone markets will have a more difficult time providing quality backbone service as their vulnerability to discriminatory practices by the largest backbones is highest.

66. Administration of the NAPs was originally awarded to service providers by the National Science Foundation to fill a public interest need for public interconnection points. Some of the

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[36] Michael Katz and Carl Shapiro, *Network Externalities, Competition, and Compatibility*, p.425.

original operators of the NAPs, including MFS (now owned by WorldCom) subsequently vertically integrated into the ISP and backbone service markets. Internet scholars Joseph Bailey and Lee McKnight have argued that public interconnection should be run by third-party administrators who do not compete with the backbone networks they interconnect to avoid potential conflicts of interest.[37]

67. Finally, the merger of MCI/WorldCom will create an additional barrier to entry in certain geographic markets because of the merged companies vertical integration into both backbone services and long-distance transmission facilities. In smaller urban markets the only suppliers of interLATA long distance transmission facilities are the big four interexchange carriers, AT&T, MCI, Sprint, and WorldCom. The deployment of new fiber optic networks by companies such as IXC Communications, the Williams Company and Qwest only cover a small portion of the entire United States. When MCI and WorldCom merge, their horizontal market power over transmission facilities and POPs in these lower density areas will increase, and their incentives to cooperate with competitors in Internet backbone markets by selling transmission facilities to them will decrease.[38] Thus, backbones may be forced to rely on purchasing InterLATA transmission at inefficiently high prices set by the post-merger big three long distance carriers or make substantial sunk investments in building their own transmission facilities if they want to serve smaller urban areas not served by the new long distance networks being built.

## V. ANTICOMPETITIVE EFFECTS RESULTING FROM THE CHANGES IN MARKET STRUCTURE CAUSED BY THE MERGER.

68. MCI/WorldCom will be able to control the terms and conditions on which a significant amount of traffic crosses the Internet. Based on the extent of its vertical integration, MCI/WorldCom could choose to exercise market power along different segments of the Internet value chain. I would like to reiterate that anticompetitive action by a dominant backbone during

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[37] See Joseph Bailey and Lee McKnight, "Scalable Internet Interconnections Agreements and Integrated Service", *Coordinating the Internet*, edited by Brian Kahin and James Keller, MIT Press, 1997, p.314.

[38] For an analysis of these issues in Florida see: *Affidavit of Robert G. Harris on behalf of GTE Corporation, In re: Request for approval of sale of outstanding stock and merger of MCI Communications Corporation in Florida, PSC Docket No. 971375-TP*, February 10, 1998, pp. 8-10 and Exhibits 12-15.

the current dynamic stage in the development of the Internet could be particularly harmful because it would be more difficult to police by regulators and therefore might persist indefinitely.

### A. Backbone Services Market

69. Post-merger, MCI/WorldCom will have two or more times more market share than the second largest competitor and almost eight times more than the third biggest backbone. The biggest potential for the exercise of market power is directly in the backbone services market where MCI/WorldCom's horizontal market power resides. Today, no player is dominant, and each has an incentive to make efficient interconnections work. If the merger is approved, MCI/WorldCom will no longer have this incentive to cooperate. Instead, its incentives will be to mesh its own separate backbone networks as efficiently as possible, and interconnect with other players only in a manner which promotes its interests without regard for the other companies.

70. MCI/WorldCom could choose to exercise this market power in a variety of ways. For example, it could charge monopolistic interconnection rates, degrade traffic exchanges, or in the extreme, threaten to refuse interconnection. If MCI/WorldCom degraded traffic to and from other backbones, ISPs connected to those backbones would find it that much more important to link directly to the MCI/WorldCom backbone, facilitating MCI/WorldCom's ability to extract monopoly rents. MCI/WorldCom could easily implement a strategy to "pick off" competing backbones in serial sequence by degrading their service one at a time in an attempt to gain market share by inducing their customers to switch to the MCI/WorldCom backbone.

71. The fact that MCI/WorldCom was the dominant provider, combined with the inferior service inflicted on competitors by MCI/WorldCom could be exploited even further by creating market expectations of dominance. In this regard, Carl Shapiro has noted:

> "purchase decisions in network industries are heavily influenced by buyers expectations. The positive feedback endemic to network industries derives in part from the importance of expectations: a product that is expected to fail often will fail; a product that is expected to succeed often will succeed."[39]

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[39] Carl Shapiro, Speech: *Antitrust In Network Industry*, Jan. 25, 1996, p. 7, http://www.usdoj.gov/atr/speeches/shapir.mar.

72. There is no question that if MCI/WorldCom degraded interconnection service to other backbones it would harm its own ISP and end user customers as well as the customers of other backbones. This effect could be minimized, however, by targeting backbones one at a time where the degraded service would have a small effect on MCI/WorldCom's service, but devastating effects on the service of the smaller backbone. For example if MCI/WorldCom had a 50% market share and they degraded service with a smaller backbone which had even a 20% market share, MCI/WorldCom's customers would only suffer degradation approximately 20% of the time but the smaller backbone's customers would be degraded approximately 50% of the time.

73. In addition to the market share effect described in the preceding paragraph, it appears likely that major MCI/WorldCom customers have, on average, higher switching costs than customers of some backbones such as GTEI. Thus, if MCI/WorldCom degraded traffic exchanges between itself and GTEI, more customers are likely to switch to MCI/WorldCom from GTEI than are likely to switch away from MCI/WorldCom. GTEI serves a high proportion of content providers such as web site hosts and a relatively low proportion of ISPs and end users. Content providers typically do not have long-term contracts for ISP connectivity and they face only limited technical obstacles to switching services providers. They can easily disconnect their servers from one backbone and reconnect to another one if their are receiving poor service. Content providers are particularly sensitive to any decreases in the number of "hits" to their web pages because advertising revenue and/or online sales have a direct correlation to the number of web site visitors. Those who believed they would receive better connectivity on MCI/WorldCom would quickly switch ISPs/backbones.

74. In contrast, a large portion of MCI/WorldCom's backbone customers have higher switching costs than content providers. AOL/CompuServe and MSN are quasi-vertically integrated with WorldCom due to their long term contracts, mentioned above, for backbone and other network services such as dial up modems. These companies are much less likely to switch backbones than content providers. AOL/CompuServe and MSN account for a large portion of MCI/WorldComs' backbone customer base because they control more than an estimated 50% of ISP/on-line subscriptions.[40] Additionally, I believe a high percentage of AOL's end use

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[40] AOL/CompuServe combined had 11.6 million subscribers and MSN had 2.3 million subscribers as of Fall 1997. See "National Dial-Up Access Providers," BoardWatch Internet Service Providers Directory for Fall 1997, p. 287-314. Total ISP/on-line subscribers were

customers are unlikely to defect from AOL to ISPs served by competing backbones. First, residential end use customers typically lack information about why their service is being degraded. Second, AOL's end use customers have proved reluctant to switch ISPs despite AOLs reputation for poor service quality.[41] Third, a reluctance to change email addresses may prevent many of AOL's residential end use customers from switching ISPs. Thus, I believe a substantial portion of WorldCom's ISP customer base has relatively high switching costs compared to content providers and are not likely to switch away from MCI/WorldCom in the event MCI/WorldCom degrades the exchange of traffic with a competing backbone.

75. The overall effect of MCI/WorldCom's high market share and its high proportion of customers with relatively high switching costs means MCI/WorldCom is likely to benefit from degrading interconnection with competing backbones. This is an area where further inquiry by federal policy makers would be useful to better understand the switching costs faced by ISPs, content providers and end users.

## B. Internet Exchange Services

76. Although the merger does not directly increase consolidation in the public NAP market, MCI/WorldCom could use its existing ownership of five of the public access points in the U.S. (including the key MAE East and MAE West facilities) to create a barrier to entry for new backbone service providers. As stated earlier, the NAPs can be an efficient location for backbones to interconnect with each other because they can connect with a large number of backbones at a single location. This is particularly important for smaller backbones that do not

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forecast to be 27.5 million by year-end 1997. See "Web/Online Services 1998 – Mkt Size," Cowles/Simba Information, Sept. 1, 1997, p. 24 (13.9 million/27.5 million =50.5%).

[41] For descriptions of AOL's service quality problems see Elizabeth Wasserman, "Flat Rate Pricing Keeps AOL's Lines Busy," *San Jose Mercury News*, Dec 18, 1996; Joanie Wexler, "AOL Outage Had Many Causes," *Network World*, August 12, 1996; Laurence Zuckerman, "America Online Moves to Place its Angry Users," *The New York Times*, January 17, 1997.

have enough traffic to justify purchasing transport out to a large number of different bilateral interconnection points. In order to economize, these smaller players might reduce the number of private interconnections, and would likely choose interconnections with the dominant backbone in order to maximize access to other users. That dominant backbone would be MCI/WorldCom.

77. In its filing before the FCC on the MCI/WorldCom merger, Bell Atlantic argued that a substantial amount of international and US traffic is routed through MAE-East in Washington DC.[42] Other commentaries have claimed that MAE-East handles more than 60 percent of all worldwide traffic and an estimated 85 percent of all intra-European traffic,[43] and roughly 40 percent of U.S. Internet traffic.[44] Operating these key public interconnection points clearly gives WorldCom a degree of influence over competing backbones. Figure 5 shows the number of national backbone operators present at key public interconnection points. Notice that more than one third of all backbone presence at public NAPs occurs at WorldCom-owned NAPs and that no other NAP operator has even half as much backbone presence as WorldCom.

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[42] Attorneys for Bell Atlantic, *Petition To Deny the Application of WorldCom or, in the Alternative, To Impose Conditions*, Jan. 5, 1998, p.11.

[43] John C. Dvorak, "Breaking Up the Internet Logjam", *PC Magazine*, April 8, 1997, p. 87.

[44] P. Merrion, "What a Tangled Web Users Weave", *Crain's Chicago Business,* Dec. 9, 1996.

**Figure 5**
**National Backbone Operators' Presence at Key Public Interconnection Points[45]**

| Operator (Site) | Number of National Backbone Operators Present |
|---|---|
| WorldCom (MAE-West, San Jose) | 31 |
| WorldCom (MAE-LA) | 4 |
| WorldCom (MAE-Dallas) | 0 |
| WorldCom (MAE-Chicago) | 1 |
| WorldCom (MAE-East, Washington DC) | 32 |
| **WorldCom Total** | **68** |
| | |
| Ameritech & Bellcore (Chicago NAP) | 21 |
| SprintLink (NY NAP) | 18 |
| Pacific Bell (SF NAP) | 17 |
| CIX-West (Santa Clara) | 16 |
| PAIX (Palo Alto) | 4 |
| Digital IX NAP | 4 |
| NASA Ames Research Center (FIX-West) | 3 |
| University of Maryland (FIX-East) | 2 |
| AIX (Atlanta) | 2 |
| CIX-East (Herndon) | 1 |
| MPIX (Phoenix) | 1 |
| | |
| **Total** | **157** |

45 Source: "National Backbone Operators", *Boardwatch Internet Service Providers Directory for Fall 1997*, Copyright BoardWatch Magazine, 1997, p. 41-249.

## VI. CONCLUSION: FORWARD LOOKING ANTITRUST ENFORCEMENT IS PREFERABLE TO INTERNET REGULATION

78. The proposed MCI/WorldCom merger will have significant adverse impacts on Internet-related markets, especially the provision of "backbone" service because it would destroy the existing competitive balance in those markets. As the result of its dominant position in the post-merger backbone services market, MCI/WorldCom will be able to control the terms and conditions on which a significant amount of traffic crosses the Internet, creating the potential for it to pursue a variety of anticompetitive strategies. Given that monopolization is easier in the network based backbone services market, implementation of these strategies will surely lead to higher prices, reduced output, lower product quality, and reduced service and innovation. Therefore, under the public interest standard as developed and applied by this Commission in these matters, this Commission should deny MCI's and WorldCom's merger applications.

# Appendix A
## HISTORICAL BACKGROUND OF INTERNET DEVELOPMENT

### A. The Initial of Internet development

A.1 The Internet began with projects developed by a governmental agency, the Advanced Research Project Administration (ARPA), in the late 1960's. During the 1970's, ARPA's network, ARPANET, supported university and research organizations, as well as government agencies. The purpose of ARPANET was to facilitate communications among researchers, and to demonstrate the ability of the newly developed Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate across a variety of physical mediums including telephony, wireless links, and satellites.

A.2 In 1985, the National Science Foundation (NSF) created 5 national supercomputer centers for use by researchers across the country, and developed a "backbone"[46] network based on TCP/IP to link these centers together. NSFNET, as the network was called, was the first stage of what we know today as the Internet. Any research institution that had a need to use the supercomputing facilities in one of the five national centers could link to the NSFNET, and run programs on the supercomputers remotely. Once many institutions became interconnected, however, it quickly became apparent that the network could not only be used to gain access to the supercomputing centers, but would be useful for electronic mail and file transfers between research facilities.

A.3 The size of the Internet grew as more and more educational and research institutions connected to the NSFNET. Applications totally divorced from supercomputing developed and eventually were used more frequently than the supercomputing applications themselves. All activities were still not-for-profit and oriented towards academic research.

A.4 In the mid-1980's, for-profit entities realized the potential of this interconnected network and ultimately gained access to the NSFNET backbone. A new non-profit entity, Advanced Network Systems (ANS) was formed to sell access to the NSFNET backbone for commercial entities. It was at this time that the first for-profit providers of Internet service emerged,

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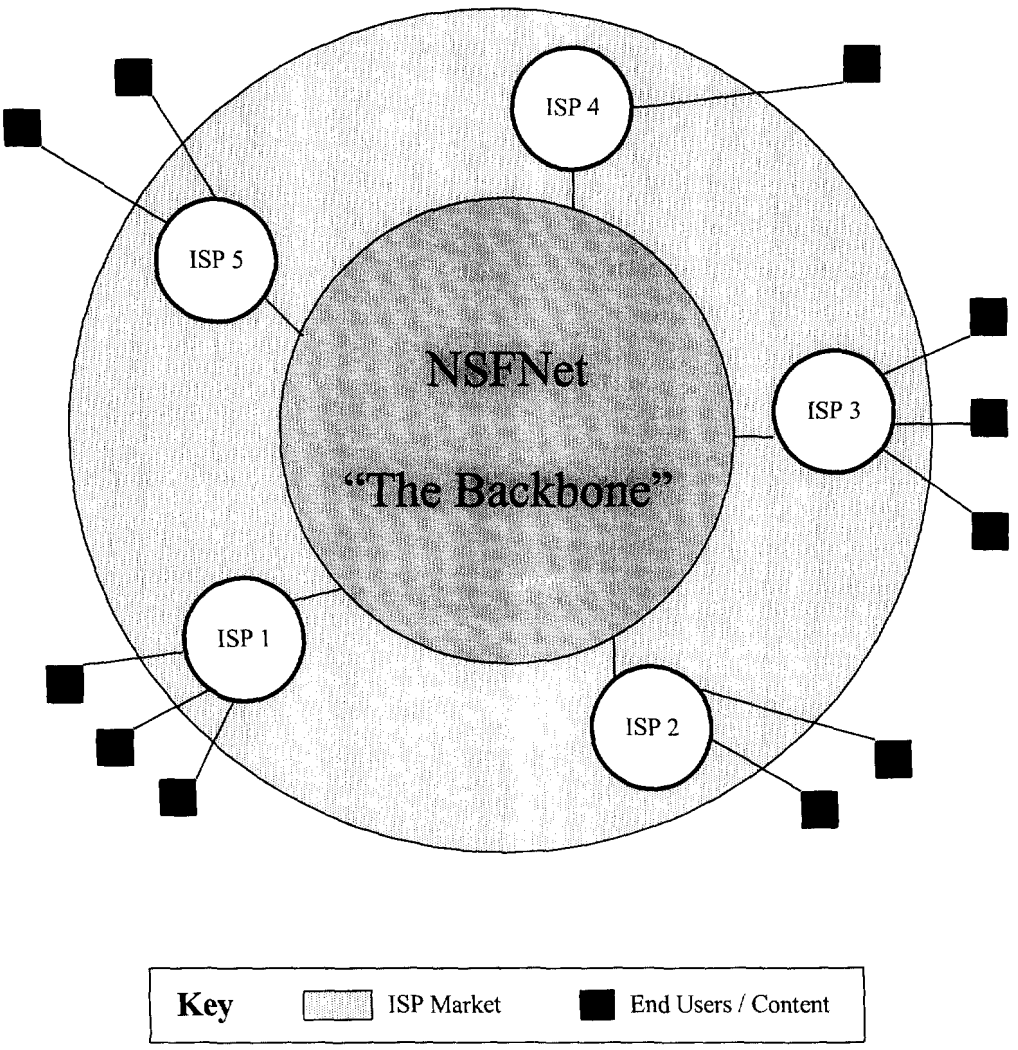
[46] A "backbone" is simply a leased or owned telecommunications line that links one or more areas together.

UUNET and PSI. The services provided by these new entities was to connect customers to regional networks over high speed communication links, and to each other by interconnecting with the "centralized" NSFNET backbone.

A.5 The following picture, taken from a report written by Kevin Werbach at the FCC's Office of Plans and Policy, depicts the market during the time the NSFNET operated as "the backbone":

**Figure A-1**
**The Internet Under NSFNet**

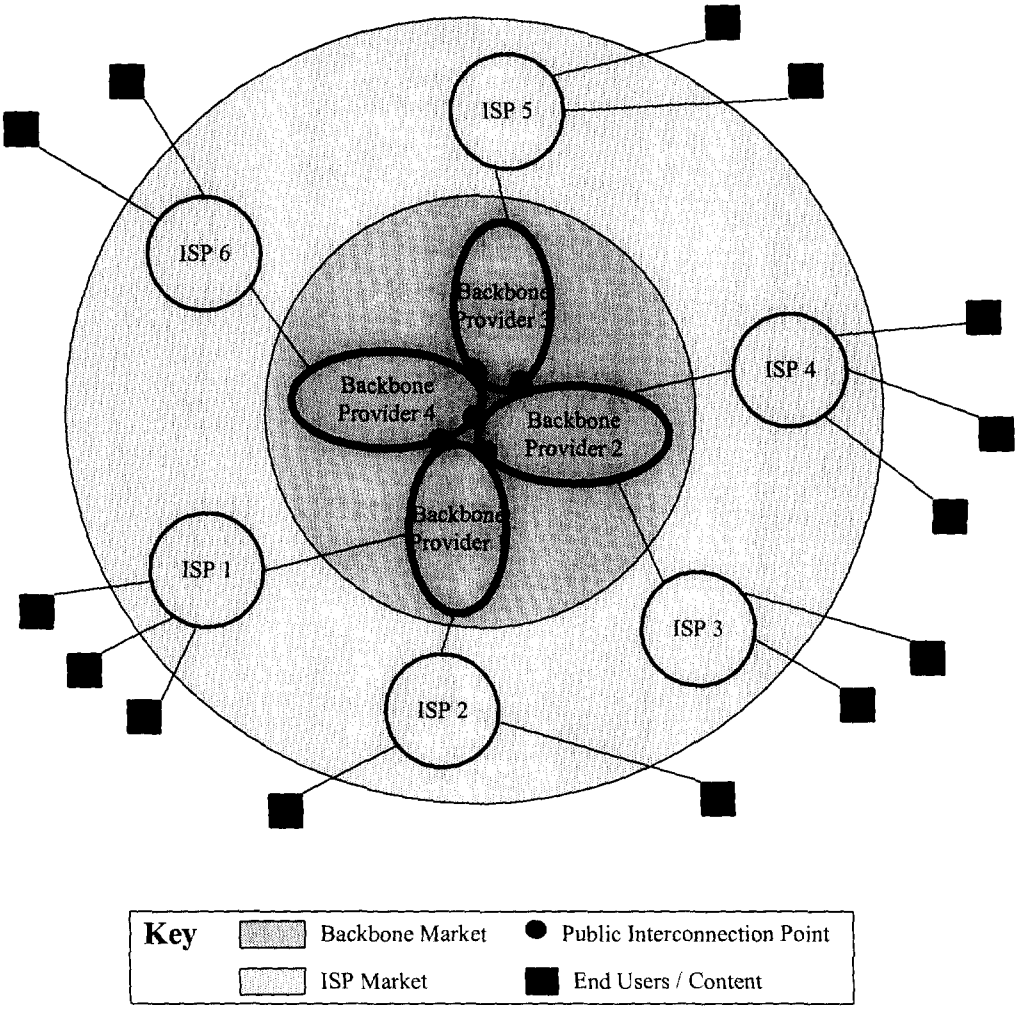



Source: Kevin Werbach, "Digital Tornado: the Internet and Telecommunications Policy", *FCC Office of Plans and Policy*, March 1997.

## B. The Privatization of the Internet

A.6 In 1993, the NSF decided to shut down the NSFNET backbone. Since commercial network services only connected to each other indirectly by interconnecting with the NSFNET, it was necessary for the NSF to create a series of public interconnection points, called Network Access Points (NAPs), where private commercial backbone operators could connect directly with each other. After the NAPs were created, the NSFNET was no longer needed, and did shut down. Since that time, a centralized core "backbone" network has not existed on the Internet. The following picture, also based on Kevin Werbach's report, depicts the market subsequent to the time NSFNET ceased to operate.

**Figure A-2**
**The Internet Architecture After NSFNet**



A7. Subsequent to the shut-down of NSFNET, it was necessary for the backbone operators to establish contractual relationships with each other to provide for backbone access and pricing. The backbone market was relatively small at that point, and no single backbone provider dominated the market. As a result, backbone operators cooperated to ensure interconnection and interoperability among and across competing networks.

A.8 During this time the number of backbone and other Internet Service Providers increased tremendously and backbone service providers developed private interconnection points, allowing them to interchange and route traffic from one carrier to another.

# Appendix B
# Key WorldCom Acquisitions Prior to the Proposed MCI Merger

| Date | Event (Target Company in Bold) | Markets of Target Company |
|---|---|---|
| 88-93 | LDDS Acquired **16 Long Distance Resale Companies** (1) | Long Distance Resale |
| 3/92 | IDB Acquired **World Communications** (1) | Facilities-Based Long Distance Carrier |
| 12/94 | LDDS Acquired **IDB WorldCom** (1) | Facilities-Based Long Distance Carrier |
| 1/95 | LDDS Acquired **WilTel** (1) | Facilities-Based Long Distance Carrier |
| 1/95 | UUNet Signed a five-year agreement With **MSN** to Provide Backbone and Network Services (2) | Online Service |
| 5/95 | LDDS Changed Name to **WorldCom** (1) | |
| 8/95 | WorldCom Launched **GridNet** (1) | Internet Backbone, ISP |
| 11/95 | UUNet Entered Into an Agreement to Acquire 40 Percent of **EUNet Germany** (3) | ISP in Europe |
| 11/95 | UUNet Acquired **Unipalm Group PLC** (4) | ISP in United Kingdom |
| 5/96 | UUNet Announced Equity Investment in **AUNet Corporation** (5) | ISP in Asia |
| 7/96 | UUNet Acquired All of the Stock of **Metrix Interlink Corporation** (6) | ISP in Canada |
| 8/96 | MFS Acquired **UUNet** (1) | Internet Backbone and Network Service, ISP |
| 8/96 | UUNet Pipex Acquired 51.8 Percent of **INnet** (7) | ISP in Belgium |
| 1/97 | WorldCom Acquired **MFS** (1) | Local Exchange Network, Internet Backbone, ISP, NAP |
| 3/97 | Brook's Fiber Owned 20 Percent of **Verio** (8) | Internet Backbone, ISP |
| 9/97 | WorldCom Acquired **ANS & CIS** from AOL/CompuServe (1) | Internet Backbone and Network Service |
| 9/97 | UUNet Acquired **NInet** (1) | ISP in Netherlands |
| 9/97 | UUNet Signed A Five-Year Contract With **AOL/CompuServe** to Provide Backbone and Network Services (1) | ISP/Online Service with Premium Content |
| 10/97 | WorldCom Announced Definite Plan to Merge with **Brooks Fiber** (1) | Local Exchange Network, Internet Backbone, ISP |

Sources:

(1) *WorldCom, Inc. – Corporate Milestones*, http://www.wcom.com/timeline.html.

(2) Arthur Newman, *The Future of The Internet Access Industry*, Gerard Klauer Mattison & Co. LLC, May 1996, p.88.

(3) UUNet Press Release on 11/17/95, *UUNet Technologies, Inc. Intends to Acquire an Interest in EUNet Germany – Europe's Leading Internet Provider*, http://www.us.uu.net/press/press2.html#eunet.

(4) UUNet Press Release on 11/15/95, *UUNet Technologies, Inc. Acquires Unipalm Group PLC*, http://www.us.uu.net/press/press2.html#eunet.

(5) UUNet Press Release on 5/20/96, *UUNet Technologies Adds New International Services; Moves Establish Company As a World-Wide Leader in Global Internet Services*, http://www.us.uu.net/press/intl.html.

(6) UUNet Press Release on 7/18/96, *UUNet Technologies, Inc. Acquires Metrix Interlink Corporation*, http://www.us.uu.net/press/metrix.html.

(7) Sylvia Dennis, "Uunet Pipex Takes Major Stake In Belgium's INnet ISP", *Newsbytes*, 8/14/96, pNEW08140053.

(8) Margie Semilog, "Verio is Striving to be the Biggest Small Carrier", *Computer Reseller News*, Nov. 3, 1997, n761, p166(1).

**AFFIDAVIT OF ROBERT G. HARRIS**

I hereby swear, under penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief.

Robert G. Harris

Robert G. Harris

State of California )

County of Alameda )

Subscribed and sworn to before me this 13th day of March 1998.

Jacqueline O'Neill

Notary Public

My Commission Expires

Dec. 6, 2000

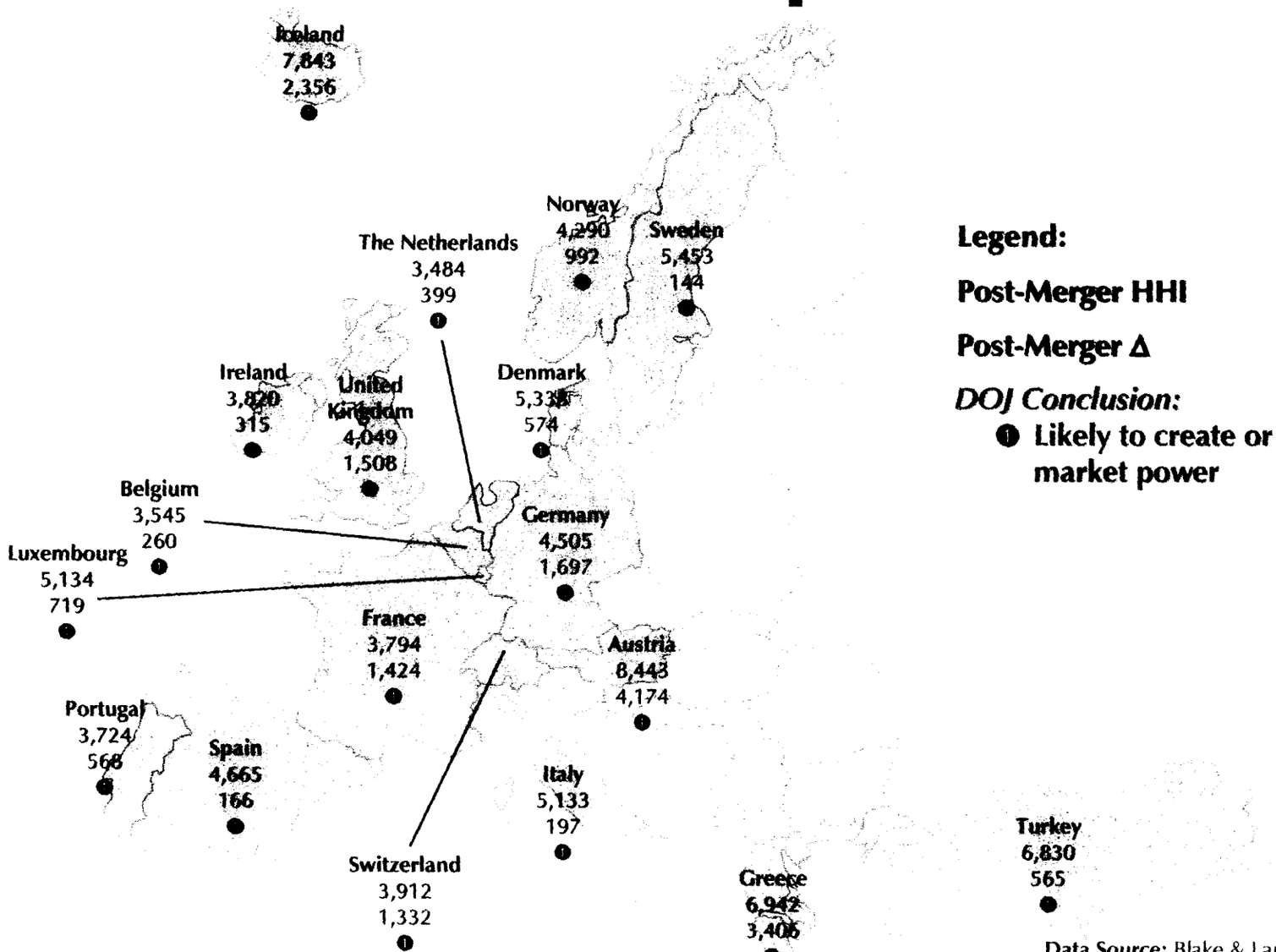
JACQUELINE O'NEILL
Commission # 1119125
Notary Public — California
Alameda County
My Comm. Expires Dec 6, 2000

# APPENDIX 6

# International Private Line HHI Analysis by Geographic Market

# International Private Line HHI Analysis

# Europe




**Legend:**

**Post-Merger HHI**

**Post-Merger Δ**

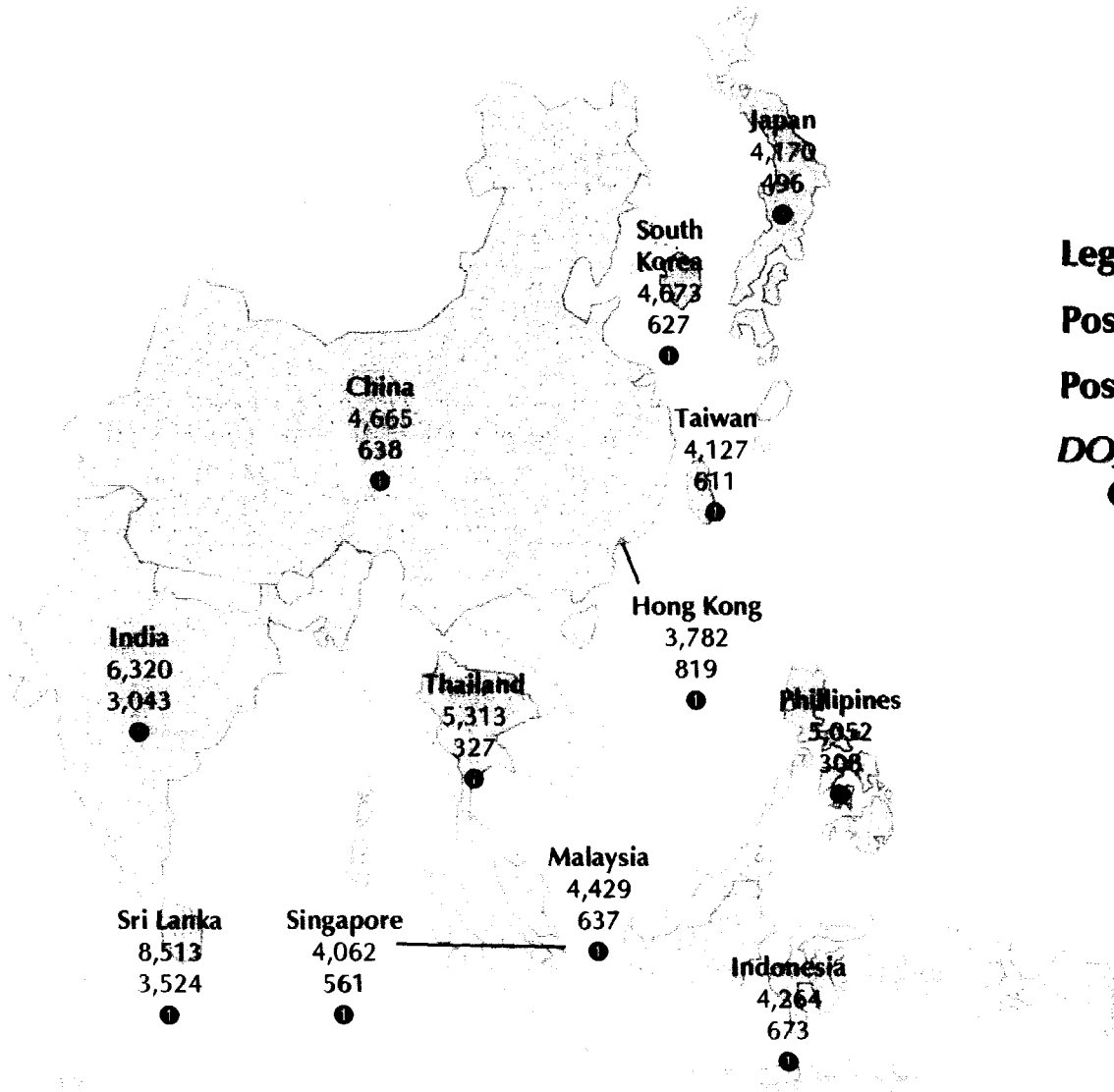
***DOJ Conclusion:***

❶ **Likely to create or enhance market power**

**Data Source:** Blake & Lande, 1996 Section 43.61 International Telecommunications Data, January 28, 1998

# International Private Line HHI Analysis

# Asia




**Legend:**

**Post-Merger HHI**

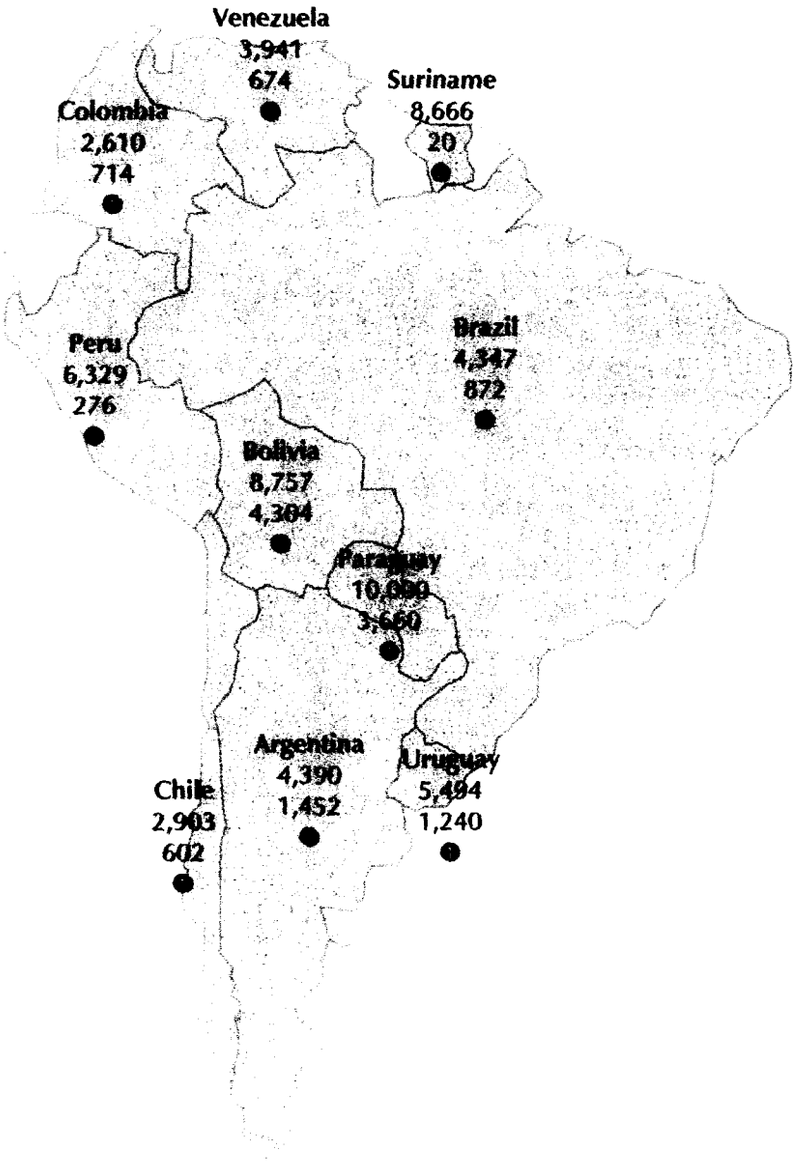
**Post-Merger Δ**

***DOJ Conclusion:***

**❶ Likely to create or enhance market power**

**Data Source:** Blake & Lande, 1996 Section 43.61 International Telecommunications Data, January 28, 1998

# International Private Line HHI Analysis
# South America




**Legend:**

**Post-Merger HHI**

**Post-Merger Δ**

***DOJ Conclusion:***

- **Likely to create or enhance market power**
- **No further action**

**Data Source:** Blake & Lande, 1996 Section 43.61 International Telecommunications Data, January 28, 1998

# INTERNATIONAL PRIVATE LINE HHI ANALYSIS

### Table 1: WorldCom - MCI Private Line Overlap Markets - Europe

| Area/Country | Austria | Belgium | Denmark | France | Germany |
|---|---|---|---|---|---|
| Post Merger HHI | 8,443 | 3,545 | 5,338 | 3,794 | 4,505 |
| Post Merger Delta | 4,174 | 260 | 574 | 1,424 | 1,967 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

| Area/Country | Greece | Iceland | Ireland | Italy | Luxembourg |
|---|---|---|---|---|---|
| Post Merger HHI | 6,942 | 7,843 | 3,820 | 5,133 | 5,134 |
| Post Merger Delta | 3,406 | 2,356 | 315 | 197 | 719 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

| Area/Country | The Netherlands | Norway | Portugal | Spain | Sweden |
|---|---|---|---|---|---|
| Post Merger HHI | 3,484 | 4,290 | 3,724 | 4,665 | 5,453 |
| Post Merger Delta | 399 | 992 | 568 | 166 | 144 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

| Area/Country | Switzerland | Turkey | United Kingdom |
|---|---|---|---|
| Post Merger HHI | 3,912 | 6,830 | 4,049 |
| Post Merger Delta | 1,332 | 565 | 1,508 |
| DOJ Conclusion | LCMP | LCMP | LCMP |

### Table 2: WorldCom - MCI Private Line Overlap Markets - Africa

| Area/Country | Angola | Cameroon | Congo | Egypt | Kenya |
|---|---|---|---|---|---|
| Post Merger HHI | 10,000 | 10,000 | 10,000 | 6,092 | 10,000 |
| Post Merger Delta | 2,103 | 2,512 | 411 | 2,947 | 3,902 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

| Area/Country | Saint Helena | South Africa |
|---|---|---|
| Post Merger HHI | 10,000 | 3,906 |
| Post Merger Delta | 4,628 | 710 |
| DOJ Conclusion | LCMP | LCMP |

### Table 3: WorldCom - MCI Private Line Overlap Markets - Middle East

| Area/Country | Bahrain | Israel | Oman | Saudi Arabia |
|---|---|---|---|---|
| Post Merger HHI | 4,334 | 3,488 | 6,427 | 4,695 |
| Post Merger Delta | 16 | 931 | 882 | 489 |
| DOJ Conclusion | NFA | LCMP | LCMP | LCMP |

**Table 4: WorldCom - MCI Private Line Overlap Markets - Caribbean**

| Area/Country | Bahamas | Barbados | Bermuda | Cayman Islands | Dominican Republic |
|---|---|---|---|---|---|
| Post Merger HHI | 4,268 | 5,393 | 3,554 | 4,770 | 2,971 |
| Post Merger Delta | 652 | 647 | 1,358 | 1,436 | 230 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

| Area/Country | Haiti | Jamaica | Netherlands Antilles | Trinidad and Tobago | British Virgin Islands |
|---|---|---|---|---|---|
| Post Merger HHI | 4,833 | 5,233 | 4,482 | 4,316 | 6,306 |
| Post Merger Delta | 369 | 689 | 723 | 719 | 937 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

**Table 5: WorldCom - MCI Private Line Overlap Markets - North America**

| Area/Country | Belize | Canada | Costa Rica | El Salvador | Guatemala |
|---|---|---|---|---|---|
| Post Merger HHI | 5,775 | 4,597 | 4,587 | 6,729 | 3,846 |
| Post Merger Delta | 912 | 36 | 818 | 32 | 419 |
| DOJ Conclusion | LCMP | NFA | LCMP | NFA | LCMP |

| Area/Country | Honduras | Mexico | Panama |
|---|---|---|---|
| Post Merger HHI | 3,405 | 4,180 | 3,407 |
| Post Merger Delta | 186 | 418 | 484 |
| DOJ Conclusion | LCMP | LCMP | LCMP |

**Table 6: WorldCom - MCI Private Line Overlap Markets - South America**

| Area/Country | Argentina | Bolivia | Brazil | Chile | Colombia |
|---|---|---|---|---|---|
| Post Merger HHI | 4,390 | 8,757 | 4,347 | 2,903 | 2,610 |
| Post Merger Delta | 1,452 | 4,304 | 872 | 602 | 714 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

| Area/Country | Paraguay | Peru | Suriname | Uruguay | Venezuela |
|---|---|---|---|---|---|
| Post Merger HHI | 10,000 | 6,329 | 8,666 | 5,494 | 3,941 |
| Post Merger Delta | 3,660 | 276 | 20 | 1,240 | 674 |
| DOJ Conclusion | LCMP | LCMP | NFA | LCMP | LCMP |

**Table 7: WorldCom - MCI Private Line Overlap Markets - Asia**

| Area/Country | China | Hong Kong | India | Indonesia | Japan |
|---|---|---|---|---|---|
| Post Merger HHI | 4,665 | 3,782 | 6,320 | 4,264 | 4,170 |
| Post Merger Delta | 638 | 819 | 3,043 | 673 | 496 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

**Table 7: WorldCom - MCI Private Line Overlap Markets - Asia (cont'd)**

| Area/Country | South Korea | Malaysia | Philippines | Singapore | Sri Lanka |
|---|---|---|---|---|---|
| Post Merger HHI | 4,673 | 4,429 | 5,052 | 4,062 | 8,513 |
| Post Merger Delta | 627 | 637 | 308 | 561 | 3,524 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP | LCMP |

| Area/Country | Taiwan | Thailand |
|---|---|---|
| Post Merger HHI | 4,127 | 5,313 |
| Post Merger Delta | 611 | 327 |
| DOJ Conclusion | LCMP | LCMP |

**Table 8: WorldCom - MCI Private Line Overlap Markets - Oceana**

| Area/Country | Australia | New Zealand | American Samoa | Guam | Northern Mariana Islands |
|---|---|---|---|---|---|
| Post Merger HHI | 4,095 | 5,955 | 4,806 | 4,921 | 6,861 |
| Post Merger Delta | 574 | 37 | 1,781 | 952 | 1,314 |
| DOJ Conclusion | LCMP | NFA | LCMP | LCMP | LCMP |

**Table 9: WorldCom - MCI Private Line Overlap Markets - Eastern Europe/CIS**

| Area/Country | Albania | Hungary | Kazakhstan | Russia |
|---|---|---|---|---|
| Post Merger HHI | 10,000 | 10,000 | 10,000 | 3,640 |
| Post Merger Delta | 4,836 | 1,809 | 3,574 | 327 |
| DOJ Conclusion | LCMP | LCMP | LCMP | LCMP |